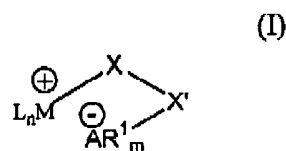
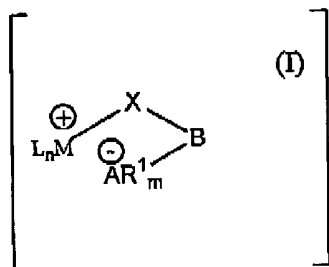


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**AMENDMENTS TO THE CLAIMS**

1. (Previously presented) A zwitterionic transition metal compound of the formula I



where

L are identical or different and are each a  $\pi$ -ligand or an electron donor, n is equal to 1, 2, 3 or 4,

M is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements,

X is a heteroatom or a hydrocarbon group having 1-40 carbon atoms,

X' is a hydrocarbon group having 1-40 carbon atoms,

A is an atom of group Ib, IIb, IIIa, IIIb, IVa, Va, Vb, VIb, VIIb or VIIIb of the Periodic Table of the Elements,

R<sup>1</sup> are identical or different and are each a perhalogenated C<sub>1</sub>-C<sub>40</sub>-hydrocarbon radical, and m is equal to 1, 2, 3, 4 or 5.

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2. (original) A transition metal compound as claimed in claim 1, wherein the radicals L are identical or different and are each a  $\pi$ -ligand.
3. (original) A transition metal compound as claimed in claim 1, wherein the radicals L are identical or different and are each an unsubstituted or substituted cyclopentadienyl group.
4. (original) A transition metal compound as claimed in claim 1, wherein the radicals L are linked to one another via a bridge.
5. (original) A transition metal compound as claimed in claim 1, wherein  $n=2$  when M is a metal atom of group IVb of the Periodic Table of the Elements.
6. (original) A transition metal compound as claimed in claim 1, wherein
 

M is a metal atom of group IVb of the Periodic Table of the Elements, n is equal to 2,

L are identical or different and are each a substituted or unsubstituted cyclopentadienyl group, where two radicals L are optionally linked to one another via a bridge Z and

Z is  $CR^2R^3$  or  $SiR^2R^3$  or a unit  $Si-(CR^2R^3)_x-Si$  which links two fragments  $L_nM^+XX'-A-R_m^1$  with one another, where x is an integer from 0 to 10,

X and X' together form a three-membered to five-membered hydrocarbon chain which can be saturated or unsaturated and are unsubstituted or substituted by one or more  $C_1$ - $C_{20}$ -hydrocarbon radicals,

$R^2$  and  $R^3$  are identical or different and are each a hydrogen atom, a halogen atom, a  $C_1$ - $C_{20}$ -alkyl group, a  $C_1$ - $C_{10}$ -fluoralkyl group, a  $C_1$ - $C_{10}$ -alkoxy group, a  $C_6$ - $C_{14}$ -

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aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L;

A is an atom of group Ib, IIb, IIIa, IVa, Va, Vb of the Periodic Table of the Elements,

R<sup>1</sup> are identical or different and are each a perfluorinated alkyl or aryl group having from 1 to 20 carbon atoms and  
m is equal to 2, 3 or 4.

7. (original) A transition metal compound as claimed in claim 6, wherein

M is zirconium,

n is equal to 2,

L are identical or different and are each a substituted cyclopentadienyl group, where two radicals L are linked to one another via a bridge Z, where Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> and R<sup>2</sup> and R<sup>3</sup> are as defined in claim 6,

X and X' together form an unsaturated four-membered hydrocarbon chain whose hydrogen atoms are optionally replaced by C<sub>1</sub>-C<sub>20</sub>-alkyl groups,

A is boron atom,

R<sup>1</sup> are identical and are each a pentafluorophenyl group (C<sub>6</sub>F<sub>5</sub>) and

m is equal to 3.

8. (original) A catalyst component comprising at least one transition metal compound as claimed in claim 1.

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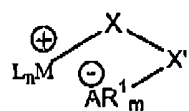
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9. (original) A catalyst component as claimed in claim 8, additionally containing a support.

10. (Previously presented) A process for preparing a compound according to claim 1 of the formula I,

(I)



where

L are identical or different and are each a  $\pi$  ligand or an electron donor, n is equal to 1, 2, 3 or 4,

M is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements,

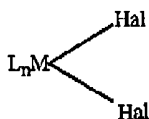
X is a heteroatom or a hydrocarbon group having 1-40 carbon atoms,

X' is a hydrocarbon group having 1-40 carbon atoms,

A is an atom of group Ib, IIb, IIIa, IIIb, IVa, Va, Vb, VIb, VIIb or VIIIb of the Periodic Table of the Elements,

R<sup>1</sup> are identical or different and are each a perhalogenated C<sub>1</sub>-C<sub>40</sub>-hydrocarbon radical, and m is equal to 1, 2, 3, 4 or 5, which comprises reacting a compound of the formula II

II

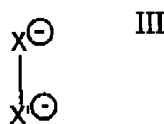
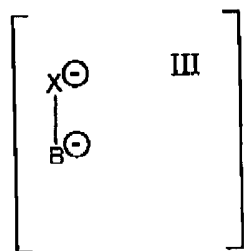


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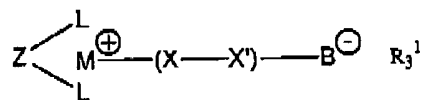
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with a compound of the formula III



and reacting the reaction product with a compound of the formula  $\text{AR}^1_m$ , where L, n, M,  $[\text{X}, \text{B}]$ ,  $\text{X}, \text{X}', \text{A}$ ,  $\text{R}^1$  and m in the formulae II, III and  $\text{AR}^1_m$  are as defined for the formula I and Hal is a halogen atom.

11. (original) A zwitterionic transition metal compound of the formula



wherein: L and L' are identical or different and are each a substituted or unsubstituted cyclopentadienyl group;

Z is a bridge linking together said L and L' and is a group of the formula  $\text{CR}^2\text{R}^3$  or  $\text{SiR}^2\text{R}^3$ ;

$\text{R}^2$  and  $\text{R}^3$  are identical or different and are each a hydrogen atom, a halogen atom, a  $\text{C}_1$ - $\text{C}_{20}$ -alkyl group, a  $\text{C}_1$ - $\text{C}_{10}$ -fluoralkyl group, a  $\text{C}_1$ - $\text{C}_{10}$ -alkoxy group, a  $\text{C}_6$ - $\text{C}_{14}$ -aryl group, a  $\text{C}_6$ - $\text{C}_{10}$ -fluoroaryl group, a  $\text{C}_6$ - $\text{C}_{10}$ -aryloxy group, a  $\text{C}_2$ - $\text{C}_{10}$ -alkenyl group, a  $\text{C}_7$ - $\text{C}_{40}$ -arylalkyl group, a  $\text{C}_7$ - $\text{C}_{40}$ -alkylaryl group, a  $\text{C}_8$ - $\text{C}_{40}$ -

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arylalkenyl group, or  $R^2$  and  $R^3$  together with the atoms connected them form one or more rings, and  $R^2$  and  $R^3$  are optionally bonded to L;

M is a metal atom of group IVb of the Periodic Table of the Elements;

X-X' is a 3- to 5-membered saturated or unsaturated hydrocarbon chain which is

unsubstituted or substituted by one or more  $C_1$ - $C_{20}$ -hydrocarbon radicals; and

the  $R^1$  radicals are identical or different and are each a perfluorinated alkyl or aryl group having from 1 to 20 carbon atoms.

12. (original) A catalyst system for olefin polymerization comprising a transition metal compound of claim 11 and, optionally, a catalyst support material.

13. (original) A catalyst system as claimed in claim 12, wherein said catalyst system is essentially free of an aluminoxane except when said catalyst support material is present and is a solid aluminoxane.

14. (original) The catalyst as claimed in claim 8, wherein M is titanium, zirconium or hafnium.

15. (original) The catalyst as claimed in claim 12, wherein M is zirconium.

16. (original) The catalyst as claimed in claim 14, wherein an unsubstituted or M is Zr,  
n is equal to 2,

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L are identical or different and are each a substituted cyclopentadienyl group, where two radicals L are linked to one another via a bridge Z, and

Z is  $\text{CR}^2 \text{R}^3$  or  $\text{SiR}^2 \text{R}^3$  or a unit  $\text{Si}-(\text{CR}^2 \text{R}^3)_x-\text{Si}$  which links two fragments  $\text{L}_n \text{M}^+$

$\text{XX}'\text{A}-\text{R}_m^1$  with one another, where x is an integer from 0 to 10,

X and X' together form a three-membered to five-membered ( $\text{C}_3$  - $\text{C}_5$ )-alkyl chain which is saturated or unsaturated and optionally substituted by  $\text{C}_1$  - $\text{C}_{20}$  -hydrocarbon radicals,

A is a metal of group Ib, IIb, IIIb, IVa, Vb, of the Periodic Table of the Elements,

$\text{R}^1$  are identical or different and are each a pentafluorinated alkyl or aryl group having from 1 to 20 carbon atoms,

$\text{R}^2$  and  $\text{R}^3$  are identical or different and are each a hydrogen atom, a halogen atom, a  $\text{C}_1$  - $\text{C}_{20}$  -alkyl group, a  $\text{C}_1$  - $\text{C}_{10}$  -fluoralkyl group, a  $\text{C}_1$  - $\text{C}_{10}$  -alkoxy group, a  $\text{C}_6$  - $\text{C}_{14}$  -aryl group, a  $\text{C}_6$  - $\text{C}_{10}$  -fluoroaryl group, a  $\text{C}_6$  - $\text{C}_{10}$  -aryloxy group, a  $\text{C}_2$  - $\text{C}_{10}$  -alkenyl group, a  $\text{C}_7$  - $\text{C}_{40}$  -arylalkyl group, a  $\text{C}_7$  - $\text{C}_{40}$  -alkylaryl group, a  $\text{C}_8$  - $\text{C}_{40}$  -arylalkenyl group and

m is equal to 3.

17. (original) The catalyst as claimed in claim 8, wherein

M is zirconium,

n is equal to 2,

L are identical or different and are each a substituted cyclopentadienyl group, where two radicals L are bonded to one another via a bridge Z, where Z is  $\text{CR}^2 \text{R}^3$  or  $\text{SiR}^2 \text{R}^3$ ,

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X and X' together form an unsaturated four-membered (C<sub>4</sub>)-alkyl chain whose hydrogen atoms can also be replaced by C<sub>1</sub>-C<sub>20</sub>-alkyl groups,

A is a boron atom,

R<sup>1</sup> are identical and are each a pentafluorophenyl group (C<sub>6</sub>F<sub>5</sub>),

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group and m is equal to 3.

18. (original)The compound as claimed in claim 1, wherein the transition metal

compound of the formula I is selected from the group consisting of

bis(cyclopentadienyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

bis(methylcyclopentadienyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

bis(n-butylcyclopentadienyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

bisindenylZr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

(tert-butylamido)dimethyl(tetramethyl-η<sup>5</sup>-cyclopentadienyl)silaneZr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

bis(2-methylbenzindenyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediylbis(2-methylindenyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediylbisindenylZr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediylbis(2-methylbenzindenyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediyl(2-methylbenzindenyl)(2-methylindenyl)Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>

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 $B^-(C_6F_5)_3;$ dimethylsilanediyl(2-methylbenzoindenyl)(2-methyl-4-phenylindenyl) $Zr^+CH_2$  $CHCHCH_2B^-(C_6F_5)_3;$ dimethylsilanediyl(2-methylindenyl)(4-phenylindenyl) $Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$ dimethylsilanediylbis(2-methyl-4-phenylindenyl) $Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$ dimethylsilanediylbis(2-methyl-4,6-diisopropylindenyl) $Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$ dimethylsilanediylbis(2-methyl-4-naphthylindenyl) $Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$ isopropylidene(cyclopentadienyl)(fluorenyl) $Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$ isopropylidene(cyclopentadienyl)(indenyl) $Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$  $[4-\eta^5\text{-cyclopentadienyl-4,7,7-trimethyl-(}\eta^5\text{-4,5,6,7-tetrahydroindenyl)}Zr^+CH_2CHCHCH_2B^-(C_6F_5)_3;$ dimethylsilanediylbis(2-methylindenyl) $Zr^+OCH_2CH_2CH_2B^-(C_6F_5)_3;$ dimethylsilanediylbisindenyl $Zr^+OCH_2CH_2CH_2B^-(C_6F_5)_3;$ dimethylsilanediylbis(2-methylbenzoindenyl) $Zr^+OCH_2CH_2CH_2B^-(C_6F_5)_3;$ dimethylsilanediyl(2-methylbenzoindenyl)(2-methylindenyl) $Zr^+OCH_2CH_2CH_2B^-(C_6F_5)_3;$ dimethylsilanediyl(2-methylbenzoindenyl)(2-methyl-4-phenylindenyl) $Zr^+OCH_2CH_2CH_2B^-(C_6F_5)_3;$ dimethylsilanediyl(2-methylindenyl)(4-phenylindenyl) $Zr^+OCH_2CH_2CH_2B^-(C_6F_5)_3;$ 

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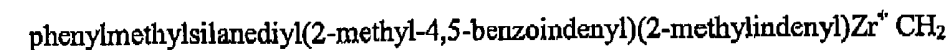
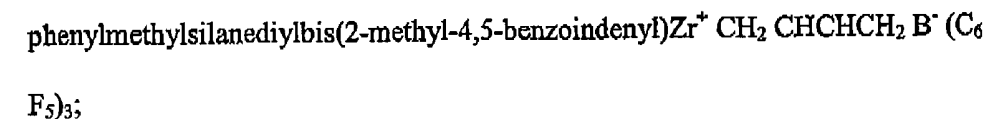
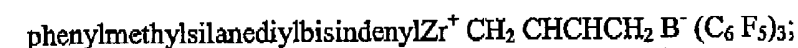
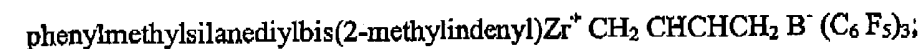
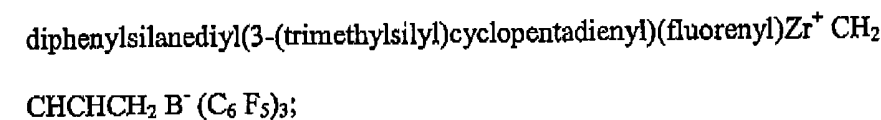
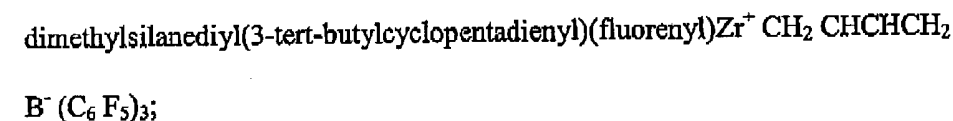
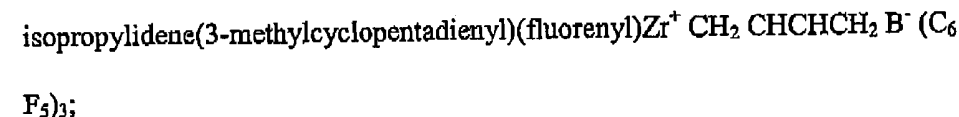
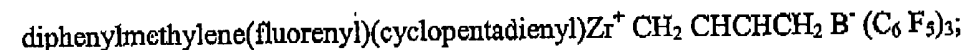
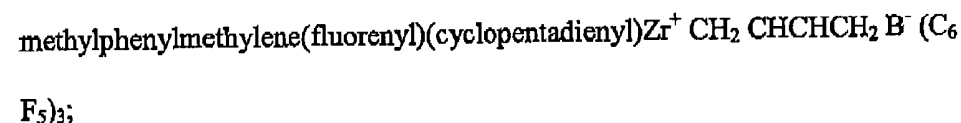
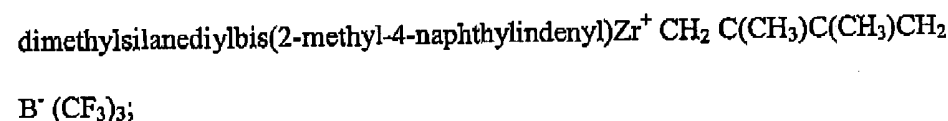
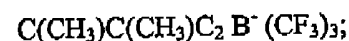
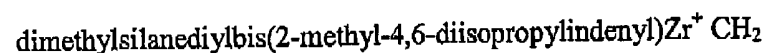
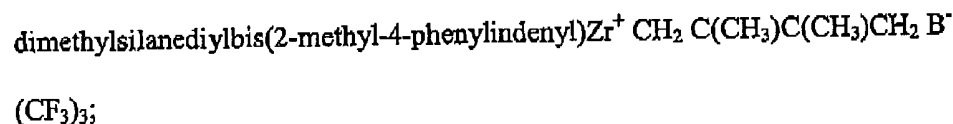
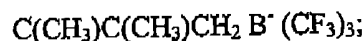
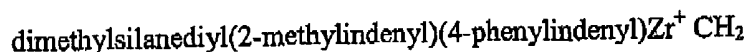
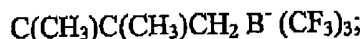
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dimethylsilanediylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> OCH<sub>2</sub> CH<sub>2</sub> CH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> OCH<sub>2</sub> CH<sub>2</sub> CH<sub>2</sub> B<sup>-</sup>  
 (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbisindenylZr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methylbenzoidenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediyl(2-methylbenzoidenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub>  
 B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediyl(2-methylbenzoidenyl)(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
 CHCHCH<sub>2</sub> CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediyl(2-methylindenyl)(4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup>  
 (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup>  
 (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbisindenylZr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediylbis(2-methylbenzoidenyl)Zr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup>  
 (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediyl(2-methylbenzoidenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
 C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
 dimethylsilanediyl(2-methylbenzoidenyl)(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub>

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 $\text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{phenylmethylsilanediyl}(2\text{-methyl-4,5-benzoindenyl})(2\text{-methyl-4-phenylindenyl})$ 
 $\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{phenylmethylsilanediyl}(2\text{-methylindenyl})(4\text{-phenylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2$ 
 $\text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{phenylmethylsilanediylbis}(2\text{-methyl-4-phenylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6$ 
 $\text{F}_5)_3;$ 
 $\text{phenylmethylsilanediylbis}(2\text{-ethyl-4-phenylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6$ 
 $\text{F}_5)_3;$ 
 $\text{phenylmethylsilanediylbis}(2\text{-methyl-4,6-diisopropylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2$ 
 $\text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{phenylmethylsilanediylbis}(2\text{-methyl-4-naphthylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^-$ 
 $(\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylenebis}(2\text{-methylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylenebisindenyl}\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylenebis}(2\text{-methyl-4,5-benzoindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylene}(2\text{-methyl-4,5-benzoindenyl})(2\text{-methylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^-$ 
 $(\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylene}(2\text{-methyl-4,5-benzoindenyl})(2\text{-methyl-4-phenylindenyl})\text{Zr}^+ \text{CH}_2$ 
 $\text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylene}(2\text{-methylindenyl})(4\text{-phenylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylenebis}(2\text{-methyl-4,5-benzoindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 
 $\text{ethylenebis}(2\text{-methyl-4-phenylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 

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ethylenebis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-ethyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-ethyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediylbis(2,3,5-trimethylcyclopentadienyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

1, 6-{bis[methylsilylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilylbis(2-methyl-4,5-benzoindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilyl(2-methyl-4-phenylindenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,2-{bis[methylsilylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane;

1,2-{bis[methylsilylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane;

1,2-{bis[methylsilylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub>

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 $F_5)_3 \}} \text{ethane};$  $1,2\text{-}\{\text{bis}[\text{methylsilyl} \text{bis}(2\text{-methyl-4,5-benzoindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6$  $F_5)_3 \}} \text{ethane}; \text{ and}$  $1,2\text{-}\{\text{bis}[\text{methylsilyl}(2\text{-methyl-4-phenylindenyl})(2\text{-methylindenyl})\text{Zr}^+ \text{CH}_2$  $\text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3 \}} \text{ethane}.$ 

19. (original) The catalyst as claimed in claim 8, wherein the transition metal compound of the formula I is selected from the group consisting of

 $\text{bis}(\text{cyclopentadienyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$  $\text{bis}(\text{methylcyclopentadienyl})\text{Zr}^+ \text{C}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$  $\text{bis}(\text{n-butylcyclopentadienyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$  $\text{bisindenyl}\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 

$(\text{tert-butylamido})\text{dimethyl}(\text{tetramethyl-}\eta^5\text{-cyclopentadienyl})\text{silane}\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^-$   
 $(\text{C}_6 \text{F}_5)_3;$

 $\text{bis}(2\text{-methylbenzoindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$  $\text{dimethylsilanediylbis}(2\text{-methylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$  $\text{dimethylsilanediylbisindenyl}\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$  $\text{dimethylsilanediylbis}(2\text{-methylbenzoindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$ 

$\text{dimethylsilanediyl}(2\text{-methylbenzoindenyl})(2\text{-methylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2$   
 $\text{B}^- (\text{C}_6 \text{F}_5)_3;$

$\text{dimethylsilanediyl}(2\text{-methylbenzoindenyl})(2\text{-methyl-4-phenylindenyl})\text{Zr}^+ \text{CH}_2$   
 $\text{CHCHCH}_2 \text{B}^- (\text{C}_6 \text{F}_5)_3;$

$\text{dimethylsilanediyl}(2\text{-methylindenyl})(4\text{-phenylindenyl})\text{Zr}^+ \text{CH}_2 \text{CHCHCH}_2 \text{B}^- (\text{C}_6$   
 $\text{F}_5)_3;$

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dimethylsilanediyibis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup>  
(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methylbenzoindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyil(2-methylbenzoindenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub>  
B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyil(2-methylbenzoindenyl)(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyil(2-methylindenyl)(4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup>  
(CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup>  
(CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyibisindenylZr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyibis(2-methylbenzoindenyl)Zr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup>  
(CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyil(2-methylbenzoindenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

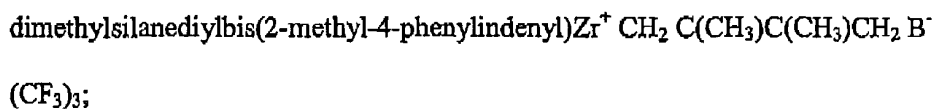
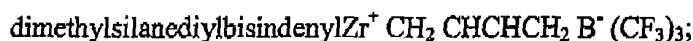
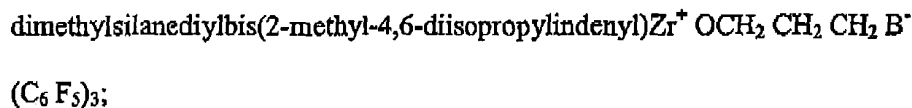
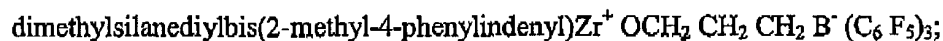
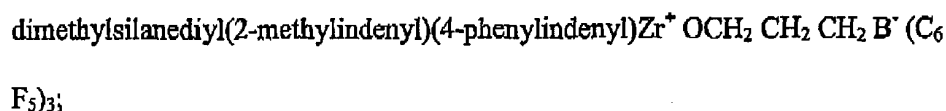
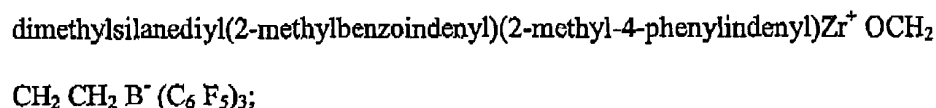
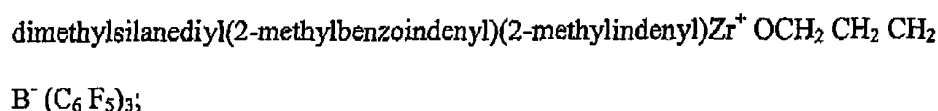
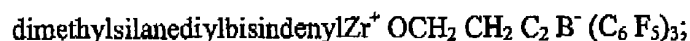
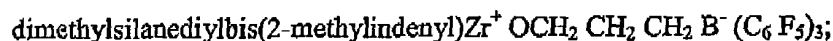
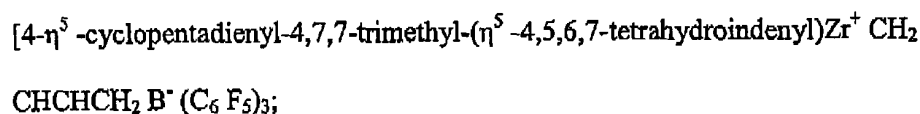
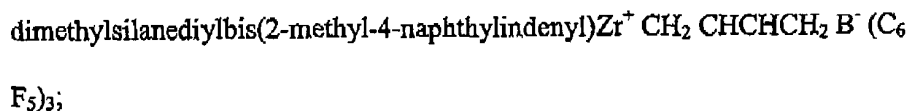
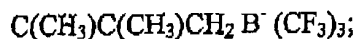
dimethylsilanediyil(2-methylbenzoindenyl)(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;

dimethylsilanediyil(2-methylindenyl)(4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub>

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dimethylsilanediylbis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub> B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
dimethylsilanediylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>  
B<sup>-</sup> (CF<sub>3</sub>)<sub>3</sub>;  
methylphenylmethylene(fluorenyl)(cyclopentadienyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub>  
F<sub>5</sub>)<sub>3</sub>;  
diphenylmethylene(fluorenyl)(cyclopentadienyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
isopropylidene(3-methylcyclopentadienyl)(fluorenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub>  
F<sub>5</sub>)<sub>3</sub>;  
dimethylsilanediyl(3-tert-butylcyclopentadienyl)(fluorenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
diphenylsilanediyl(3-(trimethylsilyl)cyclopentadienyl)(fluorenyl)Zr<sup>+</sup> CH<sub>2</sub>  
CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
phenylmethylsilanediylbis(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
phenylmethylsilanediylbisindenylZr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
phenylmethylsilanediylbis(2-methyl-4,5-benzoindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub>  
F<sub>5</sub>)<sub>3</sub>;  
phenylmethylsilanediyl(2-methyl-4,5-benzoindenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub>  
CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
phenylmethylsilanediyl(2-methyl-4,5-benzoindenyl)(2-methyl-4-phenylindenyl)  
Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;  
phenylmethylsilanediyl(2-methylindenyl)(4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

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phenylmethylsilanediylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

phenylmethylsilanediylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

phenylmethylsilanediylbis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

phenylmethylsilanediylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebisindenylZr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methyl-4,5-benzoidenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylene(2-methyl-4,5-benzoidenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylene(2-methyl-4,5-benzoidenyl)(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methyl-4,5-benzoidenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-ethyl-4,6-diisopropylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

ethylenebis(2-ethyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

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dimethylsilanediylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

dimethylsilanediylbis(2,3,5-trimethylcyclopentadienyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub>;

1, 6-{bis[methylsilylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilylbis(2-methyl-4,5-benzoindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,6-{bis[methylsilyl(2-methyl-4-phenylindenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}hexane;

1,2-{bis[methylsilylbis(2-methyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane;

1,2-{bis[methylsilylbis(2-ethyl-4-phenylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane;

1,2-{bis[methylsilylbis(2-methyl-4-naphthylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane;

1,2-{bis[methylsilylbis(2-methyl-4,5-benzoindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane; and

1,2-{bis[methylsilyl(2-methyl-4-phenylindenyl)(2-methylindenyl)Zr<sup>+</sup> CH<sub>2</sub> CHCHCH<sub>2</sub> B<sup>-</sup> (C<sub>6</sub> F<sub>5</sub>)<sub>3</sub> ]}ethane.

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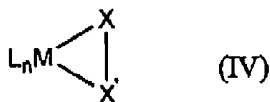
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20. (original) The compound as claimed in claim 1, wherein M is zirconium.

21. (original) The compound as claimed in claim 1, wherein M is a metal atom group  
IVb of the Periodic Table of Elements.

[22. A transition metal compound of the formula IV



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wherein

L are identical or different and are each a substituted  $\pi$  ligand.

n is equal to 1, 2, 3, or 4.

M is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the  
Elements.

X is a heteroatom or a hydrocarbon group having 1-40 carbon atoms.

X' is a hydrocarbon group having 1-40 carbon atoms.]

[23. The transition metal compound as claimed in claim 22, wherein the radicals L  
are identical or different and are each a substituted cyclopentadienyl group.

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- [24. The transition metal compound as claimed in claim 22, wherein the radicals L are linked to one another via a bridge.]
- [25. The transition metal compound as claimed in claim 22, wherein n is 2 when M is a metal atom of group IVb of the Periodic Table of the Elements.]
- [26. The transition metal compound as claimed in claim 22, wherein  
M is a metal atom of group IVb of the Periodic Table of the Elements, n is equal to  
2,  
L are identical or different and are each a substituted cyclopentadienyl group,  
where two radicals L are optionally linked to one another via a bridge Z and  
Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> or a unit Si-(CR<sup>2</sup>R<sup>3</sup>)<sub>x</sub>-Si which links two fragments  
L<sub>u</sub>MX<sub>x</sub>'A-R<sup>1</sup><sub>m</sub> with one another, where x is an integer from 0 to 10,  
X and X' together form a three-membered to five-membered hydrocarbon chain which  
can be saturated or unsaturated and are unsubstituted or substituted by one or  
more C<sub>1</sub>-C<sub>20</sub>-hydrocarbon radicals,  
R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a  
C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoroalkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-  
aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl  
group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl  
group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more  
rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.]

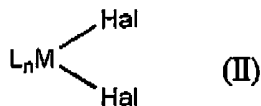
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- [27. The transition metal compound as claimed in claim 22, wherein
- M is zirconium,
- n is equal to 2,
- L are identical or different and are each a substituted cyclopentadienyl group,
- where two radicals L are linked to one another via a bridge Z, where Z is
- CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> and
- R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a
- C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-
- aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl
- group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl
- group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more
- rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L,
- X and X' together form an unsaturated four-membered hydrocarbon chain whose
- hydrogen atoms are optionally replaced by C<sub>1</sub>-C<sub>20</sub>-alkyl groups.]

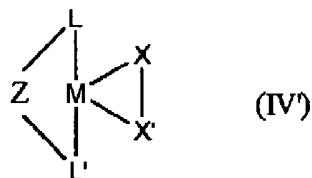
- [28. A process for preparing the compound as claimed in claim 22,
- which comprises reacting a compound of the formula II



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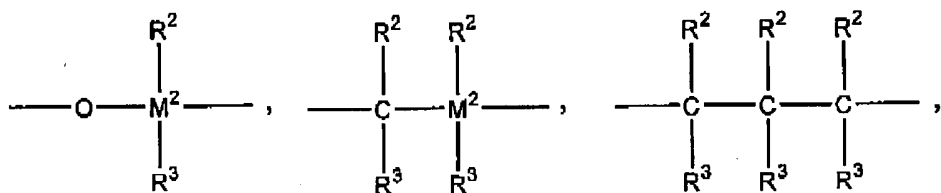
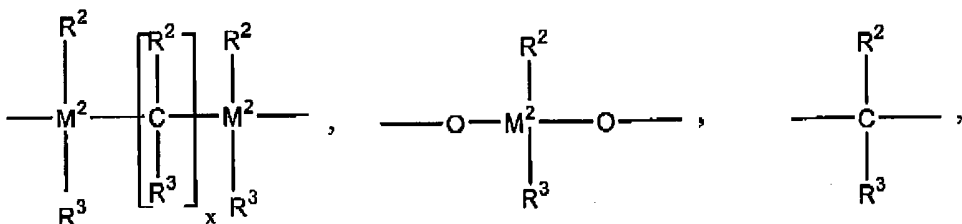
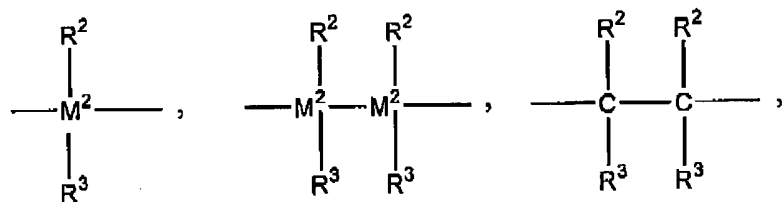
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with a compound of the formula IIIand reacting the reaction product with a compound of the formula  $AR^1_m$ , where L, n,M, X and X' in the formulae II and III are defined for the formula IV and Halis a halogen atom. ][29. A transition metal compound of the formula IV 'whereL and L' are identical or different and are each a  $\pi$  ligand or an electron donor,M is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements,X is a heteroatom or a hydrocarbon group having 1-40 carbon atoms,X' is a hydrocarbon group having 1-40 carbon atoms,Z is

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$=BR_2$ ,  $-AlR^2$ ,  $-Ge-$ ,  $-O-$ ,  $-S-$ ,  $=SO$ ,  $=SO_2$ ,  $-NR_2$ ,  $=CO$ ,  $=PR^2$  or  $=P(O)R^2$ , where  $R^2$

and  $R^3$  are identical or different and are each a hydrogen atom, a halogen atom,

a  $C_1$ - $C_{20}$ -alkyl group, a  $C_1$ - $C_1$ -fluoroalkyl group, a  $C_1$ - $C_{10}$ -alkoxy group, a  $C_6$ -

$C_{14}$ -aryl group, a  $C_6$ - $C_{10}$ -fluoroaryl group, a  $C_6$ - $C_{10}$ -aryloxy group, a  $C_2$ - $C_{10}$ -

alkenyl group, a  $C_7$ - $C_{40}$ -arylalkyl group, a  $C_7$ - $C_{40}$ -alkylaryl group, a  $C_8$ - $C_{40}$ -

arylalkenyl group and x is a number from zero to 18, or  $R^2$  and  $R^3$  together with

the atoms-connecting them form one or more rings and  $R^2$  or/and  $R^3$  can be

bonded to L and  $M^2$  is silicon, germanium or tin. ]



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- [30. The transition metal compound as claimed in claim 29, wherein the radicals L are identical or different and are each an unsubstituted or substituted cyclopentadienyl group.]
- [31. The transition metal compound as claimed in claim 29, wherein the radicals L are linked to one another via a bridge.]
- [32. The transition metal compound as claimed in claim 29, wherein n is 2 when M is a metal atom of group IVb of the Periodic Table of the Elements.]
- [33. The transition metal compound as claimed in claim 29, wherein  
M is a metal atom of group IVb of the Periodic Table of the Elements, n is equal to  
2,  
L are identical or different and are each a substituted or unsubstituted  
cyclopentadienyl group, where two radicals L are optionally linked to one  
another via a bridge Z and  
Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> or a unit Si-(CR<sup>2</sup>R<sup>3</sup>)<sub>x</sub>-Si which links two fragments  
L<sub>n</sub>M<sup>XX</sup> ' A-R<sup>1</sup><sub>m</sub> with one another, where x is an integer from 0 to 10,  
X and X ' together form a three-membered to five-membered hydrocarbon chain which  
can be saturated or unsaturated and are unsubstituted or substituted by one or  
more C<sub>1</sub>-C<sub>20</sub>-hydrocarbon radicals.

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R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.]

[34. The transition metal compound as claimed in claim 29, wherein

M is zirconium,

n is 2,

L are identical or different and are each a substituted cyclopentadienyl group, where two radicals L are linked to one another via a bridge Z, where Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup>,

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.

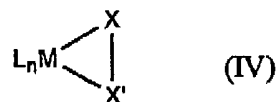
X and X' together form an unsaturated four-membered hydrocarbon chain whose hydrogen atoms are optionally replaced by C<sub>1</sub>-C<sub>20</sub>-alkyl groups. ]

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[35. A transition metal compound of the formula IV



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wherein

L are different if n is 2, 3 or 4, and are each a  $\pi$  ligand or electron donor.

n is equal to 1, 2, 3, or 4.

M is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements.

X is a heteroatom or a hydrocarbon group having 1-40 carbon atoms.

X' is a hydrocarbon group having 1-40 carbon atoms. ]

[36. The transition metal compound as claimed in claim 35, wherein the radicals L are different and are each an unsubstituted or substituted cyclopentadienyl group.]

[37. The transition metal compound as claimed in claim 35, wherein the radicals L are linked to one another via a bridge.]

[38. The transition metal compound as claimed in claim 35, wherein n is 2 when M is a metal atom of group IVb of the Periodic Table of the Elements.]

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[39. The transition metal compound as claimed in claim 35, wherein

M is a metal atom of group IVb of the Periodic Table of the Elements, n is equal to

2,

L are different and are each a substituted or unsubstituted cyclopentadienyl group,

where two radicals L are optionally linked to one another via a bridge Z and

Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> or a unit Si-(CR<sup>2</sup>R<sup>3</sup>)<sub>2</sub>-Si which links two fragments

L<sub>n</sub>M<sup>x</sup>XX' A-R<sup>1</sup><sub>m</sub> with one another, where x is an integer from 0 to 10,

X and X' together form a three-membered to five-membered hydrocarbon chain which

can be saturated or unsaturated and are unsubstituted or substituted by one or

more C<sub>1</sub>-C<sub>20</sub>-hydrocarbon radicals,

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a

C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-

aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl

group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>3</sub>-C<sub>40</sub>-arylalkenyl

group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more

rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.]

[40. The transition metal compound as claimed in claim 35, wherein

M is zirconium,

n is 2,

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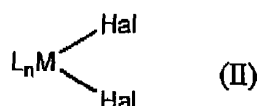
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L are different and are each a substituted cyclopentadienyl group, where two radicals L are linked to one another via a bridge Z, where Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> and

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.

X and X' together form an unsaturated four-membered hydrocarbon chain whose hydrogen atoms are optionally replaced by C<sub>1</sub>-C<sub>20</sub>-alkyl groups.]

[41. A process for preparing the compound as claimed in claim 35, which comprises reacting a compound of the formula II




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with a compound of the formula III



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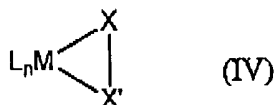
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and reacting the reaction product with a compound of the formula  $AR^1_m$ , where  $L, n,$

$M, X$  and  $X'$  in the formulae II and III are defined for the formula IV,

Hal is a halogen atom.]

[42. A transition metal compound of the formula IV



wherein

$L$  are identical or different and are each a  $\pi$  ligand or electron donor,

$n$  is equal to 1, 2, 3, or 4,

$M$  is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements,

$X$  is a heteroatom, a  $C_6-C_{14}$ -aryl group, a  $C_7-C_{40}$ -arylalkyl group, a  $C_7-C_{40}$ -alkylaryl group or a  $C_8-C_{40}$ -arylalkenyl group,

$X'$  or a hydrocarbon group having 1-40 carbon atoms.]

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- [43. The transition metal compound as claimed in claim 42, wherein the radicals L are different and are each an unsubstituted or substituted cyclopentadienyl group.]
- [44. The transition metal compound as claimed in claim 42, wherein the radicals L are linked to one another via a bridge.]
- [45. The transition metal compound as claimed in claim 42, wherein n is 2 when M is a metal atom of group IVb of the Periodic Table of the Elements.]
- [46. The transition metal compound as claimed in claim 42, wherein  
M is a metal atom of group IVb of the Periodic Table of the Elements, n is equal to  
2,  
L are different and are each a substituted or unsubstituted cyclopentadienyl group,  
where two radicals L are optionally linked to one another via a bridge Z and  
Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> or a unit Si-(CR<sup>2</sup>R<sup>3</sup>)<sub>x</sub>-Si which links two fragments  
L<sub>0</sub>M<sup>1</sup>XX' A-R<sub>m</sub><sup>1</sup> with one another, where x is an integer from 0 to 10,  
X and X' together form a three-membered or five-membered hydrocarbon chain which  
can be saturated or unsaturated and are unsubstituted or substituted by one or  
more C<sub>1</sub>-C<sub>20</sub>-hydrocarbon radicals,  
R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a  
C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-

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aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.]

[47. The transition metal compound as claimed in claim 42, wherein

M is zirconium,

n is 2,

L are different and are each a substituted cyclopentadienyl group, where two radicals L are linked to one another via a bridge Z, where Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> and

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L. ]

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[48. A compound selected from the group consisting of

Bis(methylcyclopentadienyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Bis(n-butyl-cyclopentadienyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
BisindenylZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
(tert.butylamido)dimethyl(tetramethyl- $\eta^5$ -cyclopentadienyl)sil-  
lan-Zr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>;  
Bis(2-methylbenzoidindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
DimethylsilandiylbisindenylZr<sup>+</sup>CH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis(2-methylbenzoidindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiyl(2-methylbenzoidindenyl)(2-methyl-indenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiyl(2-methylbenzoidindenyl)(2-methyl-4-phenylindenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiyl(2-methylindenyl)(4-phenylindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4-phenyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4,6-diisopropyl-indenyl)Zr<sup>+</sup>  
CH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilaniylbis(2-methyl-4-naphtyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Isopropyliden(cyclopentadienyl)(fluorenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Isopropyliden(cyclopentadienyl)(indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
(4-( $\eta^5$ -Cyclopentadienyl)-4,7,7-trimethyl-( $\eta^5$ -4,5,6,7-tetrahydro-  
indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-indenyl)ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
DimethylsilandiylbisindenylZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methylbenzoidindenyl)ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiyl(2-methylbenzoidindenyl)(2-methyl-indenyl)  
ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiyl(2-methylbenzoidindenyl)(2-methyl-4-phenylindenyl)  
ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiyl(2-methylindenyl)(4-phenylindenyl)ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4-phenyl-indenyl)ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4,6-diisopropyl-indenyl)  
ZrOCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-indenyl)ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
DimethylsilandiylbisindenylZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methylbenzoidindenyl)Zr<sup>+</sup>CH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Dimethylsilandiyl(2-methylbenzoidindenyl)(2-methyl-indenyl)  
ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Dimethylsilandiyl(2-methylbenzoidindenyl)(2-methyl-4-phenylindenyl)  
ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;

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Dimethylsilandiyl(2-methylindenyl)(4-phenylindenyl)  
ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4-phenyl-indenyl)  
ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4,6-diisopropyl-indenyl)  
ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Dimethylsilandiylbis(2-methyl-4-naphtyl-indenyl)  
ZrCH<sub>2</sub>C(CH<sub>3</sub>)C(CH<sub>3</sub>)CH<sub>2</sub>;  
Methylphenylmethylen-(fluorenyl)(cyclopentadienyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Diphenylmethylen-(fluorenyl)(cyclopentadienyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Isopropyliden-(3-methylcyclopentadienyl)(fluorenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup>(C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>;  
Dimethylsilandiyl-(3-tert.-Butylcyclopentadienyl)(fluorenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Diphenylsilandiyl-(3-(trimethylsilyl)cyclopentadienyl)(fluorenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(e-methyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
PhenylmethylsilandiylbisindenylZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(2-methyl-4,5-benzoindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(2-methyl-4,5-benzoindenyl)(2-methyl  
-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiyl(2-methyl-4,5-benzoindenyl)(2-methyl-4  
-phenylindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiyl(2-methylindenyl)(4-phenylindenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(2-methyl-4-phenyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(2-ethyl-4-phenyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(2-methyl-4,6-diisopropyl-indenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Phenylmethylsilandiylbis(2-methyl-4-naphtyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis(2-methyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
EthylenbisindenylZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis(2-methyl-4,5-benzoindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylen(2-methyl-4,5-benzoindenyl)(2-methyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylen(2-methyl-4,5-benzoindenyl)(2-methyl-4-phenylindenyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylen(2-methylindenyl)(4-phenylindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis(2-methyl-4,5-benzoindenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis(2-methyl-4-phenyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis(2-methyl-4,6-diisopropyl-indenyl)ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;

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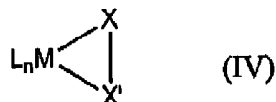
Ethylenbis (2-methyl-4-naphtyl-indenyl) ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis (2-ethyl-4-phenyl-indenyl) ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis (2-ethyl-4,6-diisopropyl-indenyl) ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Ethylenbis (2-ethyl-4-naphtyl-indenyl) ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis (2-ethyl-4-phenyl-indenyl) ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
Dimethylsilandiylbis (2,3,5-trimethylcyclopentadienyl)  
ZrCH<sub>2</sub>CHCHCH<sub>2</sub>;  
1,6- (Bis [methylsilyl-bis (2-methyl-4-phenyl-indenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) hexan;  
1,6- (Bis [methylsilyl-bis (2-ethyl-4-phenyl-indenyl)  
Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) hexan;  
1,6- (Bis [methylsilyl-bis (2-methyl-4-naphtyl-indenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) hexan;  
1,6- (Bis [methylsilyl-bis (2-methyl-4,5-benzoindenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) hexan;  
1,6- (Bis [methylsilyl- (2-methyl-4-phenyl-indenyl) (2-methyl-inde-  
nyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) hexan;  
1,2- (Bis [methylsilyl-bis (2-methyl-4-phenyl-indenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) ethan;  
1,2- (Bis [methylsilyl-bis (2-ethyl-4-phenyl-indenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) ethan;  
1,2- (Bis [methylsilyl-bis (2-methyl-4-naphtyl-indenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) ethan;  
1,2- (Bis [methylsilyl-bis (2-methyl-4,5-benzoindenyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>  
B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) ethan; and  
1,2- (Bis [methylsilyl- (2-methyl-4-phenyl-indenyl) (2-methyl-inde-  
nyl) Zr+CH<sub>2</sub>CHCHCH<sub>2</sub>B<sup>-</sup> (C<sub>6</sub>F<sub>5</sub>)<sub>3</sub>]) ethan.]

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[49. A transition metal compound of the formula IV



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wherein

L are identical or different and are each a  $\pi$  ligand or electron donor,

n is equal to 1, 2, 3, or 4,

M is a metal atom of group IIIb, IVb, Vb or VIb of the Periodic Table of the Elements,

X is a heteroatom or a hydrocarbon group having 1-40 carbon atoms,

X' is a hydrocarbon group having 1-40 carbon atoms,

with the proviso that at least one L is a substituted or unsubstituted indenyl.]

[50. The transition metal compound as claimed in claim 49, wherein the radicals L are linked to one another via a bridge.]

[51. The transition metal compound as claimed in claim 49, wherein n is 2 when M is a metal atom of group IVb of the Periodic Table of the Elements.]

[52. The transition metal compound as claimed in claim 49, wherein

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M is a metal atom of group IVb of the Periodic Table of the Elements, n is equal to 2,

where two radicals L are optionally linked to one another via a bridge Z and

Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> or a unit Si-(CR<sup>2</sup>R<sup>3</sup>)<sub>x</sub>-Si which links two fragments L<sub>m</sub>M<sup>i</sup>XX' A-R<sup>1</sup><sub>m</sub> with one another, where x is an integer from 0 to 10,

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>2</sup> and R<sup>3</sup> together with the atoms connected them form one or more rings, and R<sup>2</sup> and R<sup>3</sup> are optionally bonded to L.]

[53. The transition metal compound as claimed in claim 49, wherein

M is zirconium,

n is 2,

where two radicals L are linked to one another via a bridge Z, wherein

Z is CR<sup>2</sup>R<sup>3</sup> or SiR<sup>2</sup>R<sup>3</sup> and

R<sup>2</sup> and R<sup>3</sup> are identical or different and are each a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>20</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoralkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>6</sub>-C<sub>14</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl

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group, or  $R^2$  and  $R^3$  together with the atoms connected them form one or more rings, and  $R^2$  and  $R^3$  are optionally bonded to L.]

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